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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/635,194	08/06/2003	Youssef Abdelilah	RAL919980074US2 4269-61CT	8322
20792	7590	10/04/2004	EXAMINER KUMAR, PANKAJ	
MYERS BIGEL SIBLEY & SAJOVEC PO BOX 37428 RALEIGH, NC 27627			ART UNIT 2631	PAPER NUMBER

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/635,194

Applicant(s)

ABDELILAH ET AL

Examiner

Pankaj Kumar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 5-14, 16-22, 24-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-3, 5-11, 20-22 and 24-27 is/are allowed.
- 6) ☒ Claim(s) 12-14 and 16-19 is/are rejected.
- 7) ☒ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**1. DETAILED ACTION**

***Specification***

2. The disclosure is objected to because of the following informalities: In the cross reference to related applications section, application numbers are missing.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 12-14, 16-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite, failing to conform with current U.S. practice. They appear to have grammatical and idiomatic errors. Claim 12 recites in part: synchronized with the network clock using a linear interpolator.

**6. Allowable Subject Matter**

7. Claims 1-3, 5-11, 20-22, 24-27 are allowed.
8. Claims 12-14, 16-19 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

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9. The following is a statement of reasons for the indication of allowable subject matter:

The art of record does not suggest the respective claim combinations together and nor would the respective claim combinations be obvious with:

Polyphase interpolator in combination with linear interpolator as claimed

### ***Conclusion***

10. This application is in condition for allowance except for the following formal matters:

See action above.

Prosecution on the merits is closed in accordance with the practice under *Ex parte*

*Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (571) 272-3011. The examiner can normally be reached on Mon, Tues, Wed and Thurs after 8AM to after 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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**11. Claim Rejections - 35 USC § 103**

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

13. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1, 2, 9, 13 are rejected under 35 U.S.C. 103(a) as being anticipated by McDonough USPN 5,778,024 in view of Hodgkiss USPN 4,901,333.

15. As per claim 1, McDonough in view of Hodgkiss teach a receiver for demodulating a data signal transmitted from a digital source at a network sampling rate that is synchronized with a network clock, comprising: a two-stage interpolator, responsive to digital samples of the data signal, that, generates interpolated digital samples (McDonough fig. 5a: interpolators 460, 426 (fig. 5b: 592), 550(fig. 5c: 608); fig. 5a has external connections like in fig. 2 like buffer and modem interface and thus fig. 5a also have the external timing and timing from timing generator) in response thereto, the digital samples having a first local sample rate that is synchronized with a local clock (McDonough fig. 2: 110) and the interpolated digital samples having a second local sample rate that is synchronized with the network clock (McDonough fig. 1: external timing); an adaptive fractionally spaced decision feedback equalizer, responsive to the interpolated digital samples, that generates equalized digital samples at the network sampling rate in synchronization with the network clock (not in McDonough. Hodgkiss teaches this in fig. 1 with the adaptive equalizer that has decision feedback after interpolator. It is inherent for an equalizer to have fractionally spaced taps. It would have been obvious to one skilled in the art at the time of the invention to modify McDonough equalizer with the decision feedback adaptive equalizer of

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Hodgkiss since it would result in a better performing and more efficient system); and a slicer, responsive to the equalized digital samples, that generates detected symbols therefrom corresponding to data from the data signal (McDonough fig. 5a: 470, 572).

16. As per claim 2, McDonough in view of Hodgkiss teach the limitation since there are no restrictions in the value of  $pT/q$  and thus there is no particular spacing that will not meet the condition. Hence, Hodgkiss teaches in fig. 1, the adaptive fractionally spaced decision feedback equalizer has a tap spacing given by  $pT/q$  where  $T$  is a modulation interval associated with the network sampling rate and  $n$  and  $q$  are integers. It is inherent for an equalizer to have fractionally spaced taps.

17. As per claim 9, means for identifying a signaling alphabet used by the slicer (McDonough “code excited linear prediction” – CELP, the output of the decoder is the signaling alphabet that is identified and it goes back into the filters via other components in fig. 5a; deviation limiter 465 is limiting the signaling alphabets that can be input into the filter 470) to generate the detected symbols (McDonough fig. 5a: output of filters 470, 572).

18. As per claim 13, McDonough teaches the limitations of claim 12 as taught below. What McDonough does not teach is a fractionally spaced decision feedback equalizer. Hodgkiss teaches this in fig. 1 with the adaptive equalizer that has decision feedback after interpolator. It is inherent for an equalizer to have fractionally spaced taps. It would have been obvious to one skilled in the art at the time of the invention to modify McDonough equalizer with the decision feedback adaptive equalizer of Hodgkiss since it would result in a better performing and more efficient system. Since there are no restrictions in the value of  $pT/q$  and thus there is no particular spacing that will not meet the condition. Hence, Hodgkiss teaches in fig. 1, the

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adaptive fractionally spaced decision feedback equalizer has a tap spacing given by  $pT/q$  where  $T$  is a modulation interval associated with the network sampling rate and  $n$  and  $q$  are integers.

19. Claims 12, 17, 19 are rejected under 35 U.S.C. 103(a) as being anticipated by McDonough USPN 5,778,024.

20. As per claim 12, a method for demodulating, in a receiver, a data signal transmitted from a digital source at a network sampling rate that is synchronized with a network clock comprising the steps of: sampling the data signal to produce digital samples at a first local sample rate that is synchronized with a local clock (McDonough fig. 2: 110); interpolating (McDonough fig. 5C: 608 is interpolating and fig. 5C is element 550 which is shown in fig. 5A which is shown in fig. 5A to be after fig. 6's element 490) the digital samples to produce first and second estimates for each of the digital samples (this is not in McDonough. It is common knowledge that when inphase (I) and quadrature (Q) samples exist and they are interpolated, that first and second estimates of the digital sample are the estimates of the I and Q samples; also when at two different times there are two outputs, these are also first and second estimates. It would have been obvious to one skilled in the art at the time of the invention to modify McDonough to teach first and second estimates as claimed. One would have been motivated to do so if one had a modulation scheme such as QAM which requires inphase and quadrature components); interpolating (McDonough fig. 5A: 46, 406, 416; fig. 5A, 5B: 426, 592) the first and second estimates (McDonough fig. 5A: two serial outputs of 550) to produce interpolated digital samples having a second local sample rate (McDonough fig. 5C which is part of fig. 5A has 3x interpolation while 460 in fig. 5A has 2:5 interpolation) that is synchronized with the network



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clock (McDonough fig. 1: external timing); equalizing (McDonough fig. 4: 338, 348) the interpolated digital samples to produce equalized digital samples (McDonough fig. 4); and decoding the equalized digital samples to generate detected symbols therefrom (McDonough fig. 4: 346, 350, fig 5C: 292, fig. 5A, fig. 6).

21. As per claim 17, McDonough teaches the method as recited in claim 12 further comprising identifying a signaling alphabet used by the slicer (McDonough “code excited linear prediction” – CELP, the output of the decoder is the signaling alphabet that is identified and it goes back into the filters via other components in fig. 5a; deviation limiter 465 is limiting the signaling alphabets that can be input into the filter 470) to generate the detected symbols (McDonough fig. 5a: output of filters 470, 572).

22. As per claim 19, McDonough teaches the method as recited in claim 12 wherein the detected symbols are PCM (McDonough col. 5 last line; col. 6 lines 20, 21, 24; etc.).

**23. Allowable Subject Matter**

24. Claims 3-8, 14-16, 18 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

TESFALDET BOOCURE  
PRIMARY EXAMINER

